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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Group Art Unit 3747

In re

Patent Application of

Shane Hunter

Application No. 10/706,413

Confirmation No. 6803

Filed: November 12, 2003

“A BREATHING SYSTEM FOR A
MOTORCYCLE ENGINE”

I, Sharon A. Johnson, hereby certify that this correspondence is being deposited with the US Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date of my signature.

Sharon A. Johnson
Signature

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SUBMISSION OF PRIORITY DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed is the priority document for Australia Patent Application 2002952646, filed November 12, 2002, from which the above-identified U. S. patent application claims priority.

Respectfully submitted,

David R. Price
David R. Price
Reg. No. 31,557

File No. 043153-9088-00

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**Patent Office
Canberra**

I, JONNE YABSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2002952646 for a patent by SHANE HUNTER as filed on 12 November 2002.

WITNESS my hand this
Eighteenth day of December 2003

JONNE YABSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES

AUSTRALIA
Patents Act 1990

PROVISIONAL SPECIFICATION

Applicant(s):

SHANE HUNTER

Invention Title:

A CRANKCASE BREATHER FOR A MOTORCYCLE ENGINE

The invention is described in the following statement:

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A CRANKCASE BREATHER FOR A MOTORCYCLE ENGINE

Field of the Invention

The present invention broadly relates to a crankcase
5 breather for a motorcycle engine and relates particularly,
though not exclusively, to a crankcase breather for a V-
twin motorcycle engine. Throughout this specification, the
term "manifold" is used for any conduit positioned between
an air or air/fuel inlet valve of an internal combustion
10 engine and an air-filter of the engine.

Background of the Invention

In internal combustion engines, such as 4-stroke
motorcycle engines, a small portion of exhaust gases that
15 are present after ignition of the air/fuel mixture in a
cylinder of the engine penetrates between the cylinder and
the piston into the crankcase. The amount of the exhaust
gas that penetrates between the cylinder and the piston
usually increases as the engine wears.

20 In order to reduce the resultant pressure inside the
internal combustion engine, the crankcase must be
ventilated. In order to order to reduce toxic emission of
the engine it is usually not permissible to ventilate the
crankcase directly to the environment. Crankcase
25 ventilation therefore usually comprises a tube that is
connected with one end to a portion of the crankcase and
with the other end to an air-filter element of the engine.

However, usually an oil-vapour is also emitted from
the crankcase together with the exhaust and the ejected
30 oil vapour will contaminate and eventually block-up the
air-filter element.

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Summary of the Invention

The present invention provides a crankcase breather for a motorcycle engine, the crankcase breather comprising
5 a conduit having a first portion and a second portion, the first portion being arranged for connection to the crankcase, a cylinder or cylinder head, the second portion being arranged for connection to a manifold portion between an air-filter element of the engine and an air or
10 air/fuel inlet valve of the engine such that, in use, a passage is provided between the crankcase, the cylinder or the cylinder head and the manifold portion.

As the conduit is arranged for connection between the air-filter element and the air or air/fuel inlet port of
15 the engine, contamination and blocking-up of the air-filter element can be substantially avoided as the exhaust including oil and oil vapour originating from the crankcase is sucked away from the air-filter element into the air or air/fuel inlet port during operation of the
20 engine. This may also reduce the probability that oil will reach the environment which therefore makes the crankcase breather system of the present invention more environmentally friendly compared with systems where the exhaust is directed into the air-filter element. The
25 inventors have observed that this arrangement may also results in an increase of torque of the engine.

The present invention also provides a method of ventilating a crankcase of a motorcycle engine comprising the step of directing exhaust gas from the crankcase, the
30 cylinder or the cylinder head to a manifold portion between an air-filter element and an air or air/fuel inlet port of the engine.

The present invention further provides a motorcycle

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engine having the above-defined crankcase breather.

Preferred Features of the Invention

5 The second portion of the conduit preferably is arranged for connection to a manifold portion between a carburettor of the engine and the air-filter element. The second portion of the conduit most preferably is arranged for connection to a bottom portion of the manifold.

10 The first portion of the conduit preferably is arranged for connection to a cylinder head of the engine. In case of multi-cylinder engines, the crankcase breather may comprise at least one bridge portion which is arranged to connect at least two of the cylinders or cylinder heads with the first portion of the conduit such that, in use,
15 exhaust that enters the or each bridge portion from either of the at least two cylinders or cylinder heads will be guided through the bridge portion and through the conduit into the manifold between the air or air/fuel inlet port of the engine and the air-filter element.

20 The crankcase breather preferably is composed of a metallic material.

In one preferred embodiment of the present invention, the motorcycle engine is a V-twin engine arranged such that the crankshaft of the engine is oriented in a
25 direction substantially perpendicular to the driving direction of the motorcycle. This is, for example, the case for an engine of a typical Harley Davidson motorcycle. In this case the first portion of the conduit preferably is arranged for connection to the front
30 cylinder head of the engine. The crankcase breather may comprise a bridge-portion having a first end portion arranged for connection the rear cylinder head and a second end portion arranged for connection to the front

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cylinder head. The second portion of the bridge portion preferably is connected to the first portion of the conduit such that, in use, exhaust that exits the rear cylinder head at the first portion of the bridge portion is guided through the bridge portion and, together with exhaust that exits the front cylinder head, is guided through the conduit into the manifold between air-filter element and the air or air/fuel inlet port. This arrangement has the particular advantage that, when the motorcycle is driven, oil that is expelled at the rear cylinder head is, because of the momentum associated with the acceleration of the motorbike, directed back into the rear cylinder head.

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings.

Brief description of the drawing

Figure 1 shows a schematic cross-sectional representation of a crankcase breather system according to an embodiment of the present invention.

Detailed Description of a Preferred Embodiment of the Invention

Referring to Figure 1, the crankcase breather is now described. The Figure shows the crankcase breather including an elongate tube 12 having a first end-portion 14 connected to a cylindrical portion 15. Cylindrical portion 15 is arranged for connection to a front cylinder head of a V-twin motorcycle engine (not shown). A second end-portion 16 of the tube 12 is connected to manifold 18 at a position between an air-filter element 20 and a

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carburettor (not shown). The crankcase breather includes an elongate bridge-portion 22 provided in form of an elongate tube. One end of the bridge-portion 22 is connected to the cylindrical portion 15. The other end of the bridge-portion 22 is connected to a cylindrical portion 24 which is arranged for connection to a rear cylinder head of the V-twin motorcycle engine (not shown).

The crankcase breather 10 is composed of a metallic material. The cylindrical portions 15 and 24 are hollow and the cylindrical portion 24 is welded to tube 22. The cylindrical portion 15 is welded to tubes 12 and 22. The cylindrical portion 15 has two apertures 26 and 28 and cylindrical portion 24 has one aperture 30. Cylindrical portions 15 and 24 are arranged for connection to the front and rear cylinder head, respectively, of the V-twin motorcycle engine by means of screws or bolts such that a passage is provided from the interior of the cylinder heads through the interior of the tubes 22 and 12 to the interior of the manifold 18.

Although the invention has been described with reference to particular examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms. For example, the crankcase breather may be arranged for connection to a motorcycle engine other than a V-twin engine. Further, engine may not comprise a carburettor but a fuel injection system. In this case the crankcase breather is connected to a manifold portion between an air-filter element and an air-intake valve of the engine.

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The Claims defining the Invention are as follows:

1. A crankcase breather for a motorcycle engine, the crankcase breather comprising a conduit having a first
5 portion and a second portion, the first portion being arranged for connection to the crankcase, a cylinder or a cylinder head, the second portion being arranged for connection to a manifold portion between an air-filter element of the engine and an air or air/fuel inlet valve
10 of the engine such that, in use, a passage is provided between the crankcase, the cylinder or the cylinder head and the manifold portion.
2. The crankcase breather as claimed in claim 1 wherein
15 the second portion of the conduit is arranged for connection to a manifold portion between a carburettor of the engine and the air-filter element.
3. The crankcase breather as claimed in claim 1 or 2
20 wherein the second portion of the conduit is arranged for connection to a bottom portion of the manifold.
4. The crankcase breather as claimed in any one of the preceding claims wherein the first portion of the conduit
25 is arranged for connection to a cylinder head of the engine.
5. The crankcase breather as claimed in any one of the preceding claims wherein the engine is a multi-cylinder
30 engine and which comprises at least one bridge portion, the or each bridge portion incorporating a passage arranged to connect at least two of the cylinders or cylinder heads with the first portion of the conduit such

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that, in use, exhaust that enters the or each bridge portion from either of the at least two cylinders or cylinder heads will be guided through the bridge portion and through the conduit into the manifold between the air
5 or air/fuel inlet port of the engine and the air-filter element.

6. The crankcase breather as claimed in any one of the preceding claims composed of a metallic material.

10

7. The crankcase breather as claimed in any one of the preceding claims wherein the motorcycle engine is a V-twin engine arranged such that the crankshaft of the engine is oriented in a direction substantially perpendicular to the
15 driving direction of the motorcycle and the first portion of the conduit is arranged for connection to the front cylinder head of the engine.

8. The crankcase breather as claimed in claim 7 when
20 dependent on claim 5, when the bridge-portion has a first portion arranged for connection to the rear cylinder head and a second portion is arranged for connection to the front cylinder head.

25 9. The crankcase breather as claimed in claim 8 wherein the second portion of the bridge portion is connected to the first portion of the conduit such that, in use, exhaust that exits the rear cylinder head at the first portion of the bridge portion is guided through the bridge
30 portion and, together with exhaust that exits the front cylinder head, is guided through the conduit into the manifold between air-filter element and the air or air/fuel inlet port.

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10. A method of ventilating a crankcase of a motorcycle engine comprising the step of directing exhaust gas from the crankcase a cylinder or a cylinder head to a manifold
5 portion between an air-filter element and an air or air/fuel inlet port of the engine.

11. A motorcycle engine having the crankcase breather as defined in any one of claims 1 to 9.

10

Dated this 12TH day of NOVEMBER 2002

SHANE HUNTER

By his Patent Attorneys

15 GRIFFITH HACK

1/1

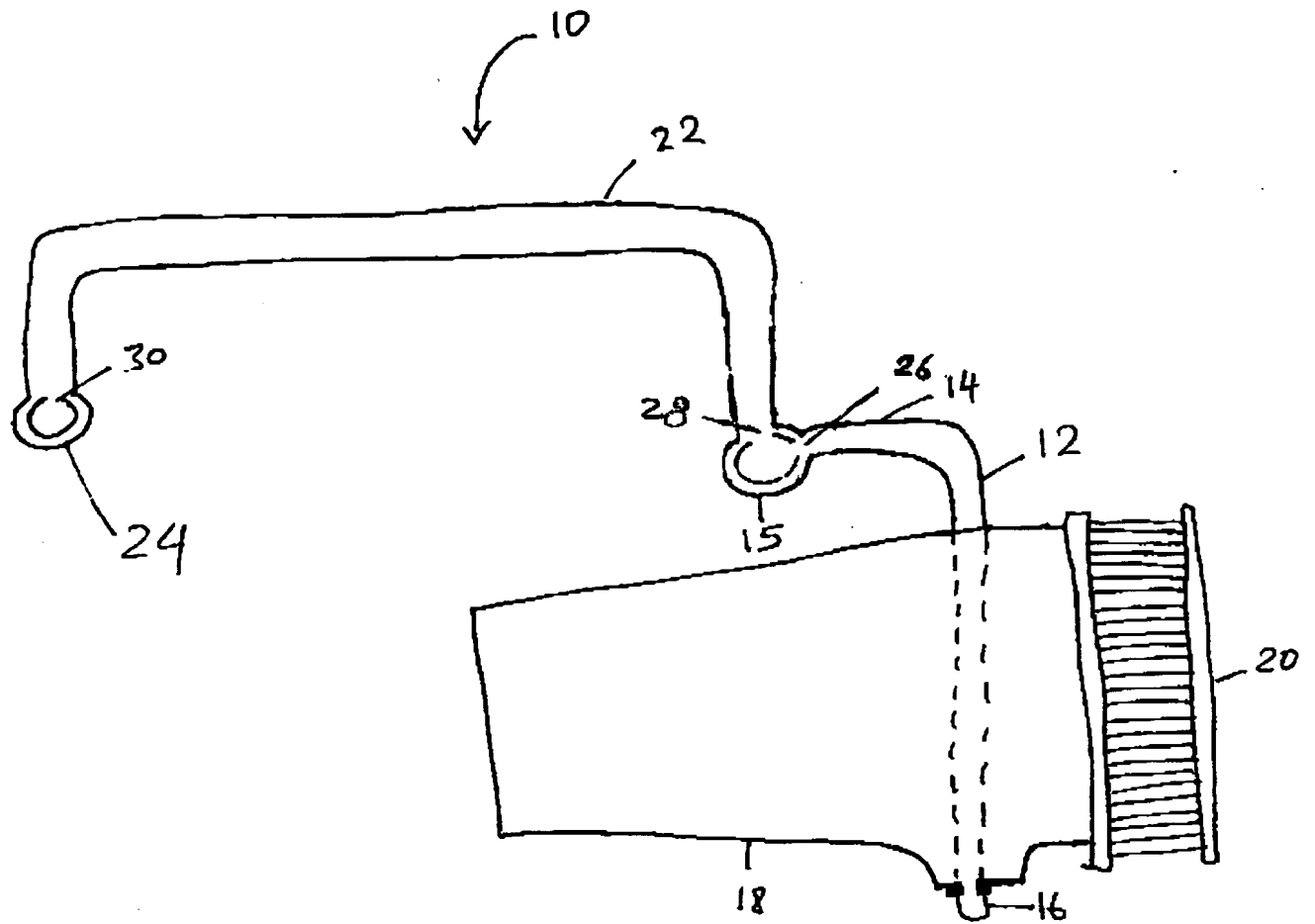


FIG. 1